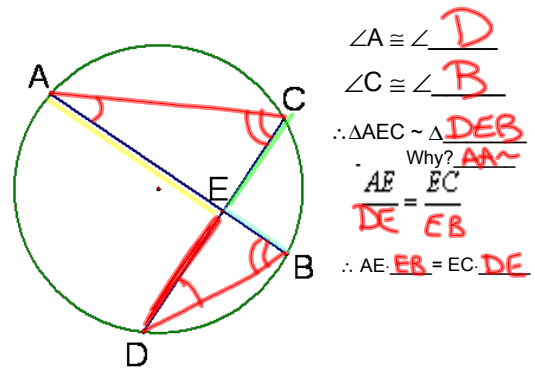
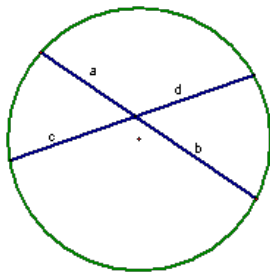


## 10-7 Notes-Special Segments in a Circle



**Theorem 10.15**-If 2 chords intersect in a circle, then the products of the measures of the segments of the chords are equal.

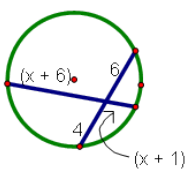
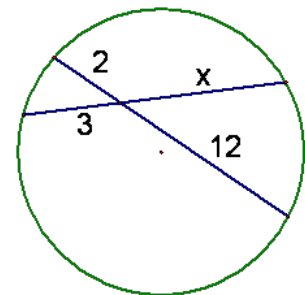
$$a \cdot b = c \cdot d$$



$$3x = 2 \cdot 12$$

$$24$$

$$x = 8$$



$$\frac{9}{-18} = \frac{-2}{7}$$

$$(x+6)(x+1) = 6 \cdot 4$$

$$x^2 + x + 6x + 6 = 24$$

$$x^2 + 7x - 18 = 0$$

$$x^2 + 9x - 2x - 18 = 0$$

$$x(x+9) - 2(x+9) = 0$$

$$(x-2)(x+9) = 0$$

$$x = 2 \quad x = -9$$

$$\angle A \cong \angle C$$

$$\angle E \cong \angle E$$

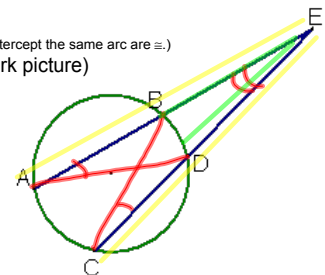
(Inscribed  $\angle$ s that intercept the same arc are  $\cong$ )  
(reflexive) (mark picture)

$$\therefore \triangle AED \sim \triangle CEB$$

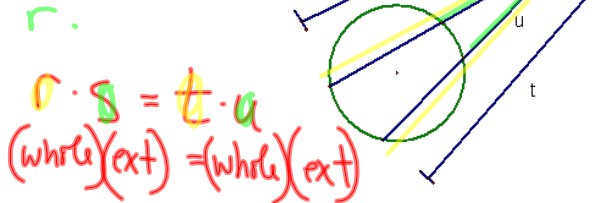
Why? AA~

$$\frac{AE}{CE} = \frac{ED}{EB}$$

$$\therefore AE \cdot EB = ED \cdot CE$$



**Theorem 10.16**-If two secant segments are drawn to a circle from an exterior point, then the product of the measures of one secant segment and its external secant segment is equal to the product of the measures of the other secant segment and its external secant segment.



$$y = x + 4$$

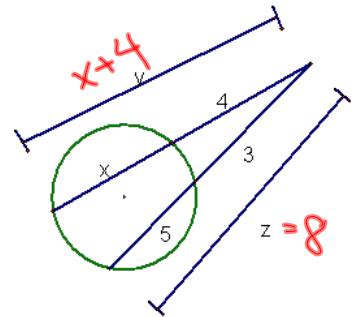
$$z = 8$$

$$4(x+4) = 8 \cdot 3$$

$$4(x+4) = 24$$

$$x+4 = 6$$

$$x = 2$$



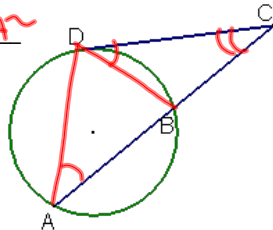
Connect A & D to form  $\triangle ACD$ .

Connect B & D to form  $\triangle BDC$ .

$\angle A$  intercepts what arc?  $\overline{DB}$   
 $\angle CDB$  intercepts what arc?  $\overline{DB}$   
 What conclusion can you make?  $\angle A \cong \angle CDB$   
 (mark picture)  
 $\therefore \triangle ACD \sim \triangle DCB$  Why? AA~  
 (Hint: reflexive  $\angle C$ )

$$\frac{AC}{DC} = \frac{CD}{CB}$$

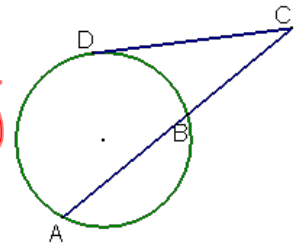
$$\therefore AC \cdot \underline{CB} = CD \cdot \underline{DC}$$



**Theorem 10.17**-If a tangent segment and a secant segment are drawn to a circle from an exterior point, then the (measure of the tangent segment)<sup>2</sup> = the product of the measures of the secant segment and its external secant segment

$$CD^2 = AC \cdot BC$$

$$tan^2 = (whole)(ext)$$



$$(x+4)^2 = x(2x+2)$$

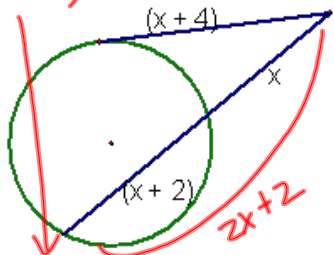
$$(x+4)(x+4) =$$

$$x^2 + 8x + 16 = 2x^2 + 2x$$

$$0 = x^2 - 6x - 16$$

$$(x-8)(x+2)$$

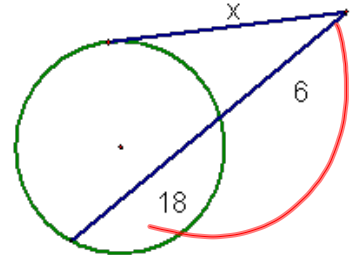
$$x = 8$$



$$x^2 = 24 \cdot 6$$

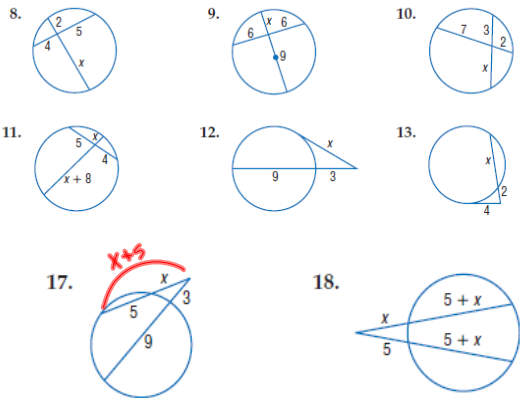
$$x^2 = 144$$

$$x = 12$$



Homework:  
p. 572-573 #s 8-13, 17, 18, 22-24, 27

Find  $x$ . Round to the nearest tenth if necessary. Assume that segments that appear to be tangent are tangent.



Find each variable. Round to the nearest tenth, if necessary.

